

ABSTRACT OF THE DISCLOSURE

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A process of fabricating a thin film semiconductor device includes the steps of: forming a semiconducting thin film on an insulating substrate; annealing the semiconducting thin film by irradiating a laser beam thereto, thereby crystallizing the semiconducting thin film; and integrally forming thin film transistors, each including the semiconducting thin film as an active layer, with a specific arrangement pitch. In the laser annealing step, a pulsed laser beam formed in a band-shape is intermittently irradiated to the insulating substrate and it is simultaneously moved relative to the insulating substrate in the lateral direction with a specific movement pitch while partially overlapping regions irradiated with the laser beam to each other. In this case, the movement pitch of the laser beam is set at a value equal to an arrangement pitch of the thin film transistors or at a value larger by a factor of an integer than the arrangement pitch, and the insulating substrate is previously positioned such that any one of boundaries of the partially overlapped regions irradiated with the laser beam is not overlapped on a channel region of each thin film transistor.